NATIONAL INSTRUMENTS NI-9775 4 Channel C Series Digitizer Module User Guide

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NATIONAL INSTRUMENTS NI-9775 4 Channel C Series Digitizer Module

Product Information: NI-9775

The NI-9775 is a device that allows for connection to a chassis. It is important to complete the software and hardware installation procedures in your chassis documentation before use. Safety guidelines must be followed to prevent product misuse that can result in hazard. The NI-9775 is only to be operated as described in the user manual, and if damaged, it should be returned to NI for repair. The device is suitable for use in Class I, Division 2, Groups A, B, C, D, T4 hazardous locations; Class I, Zone 2, AEx nA IIC T4 and Ex nA IIC T4 hazardous locations; and nonhazardous locations only.

Safety Guidelines

- Operate the NI-9775 only as described in the user manual.
- Do not operate the NI-9775 in a manner not specified in the user manual.
- Connect only voltages that are within Measurement Category O.
- Do not connect the NI-9775 to signals or use for measurements within Measurement Categories II, III, or IV.
- Do not disconnect I/O-side wires or connectors unless power has been switched off or the area is known to be nonhazardous.
- Do not remove modules unless power has been switched off or the area is known to be nonhazardous.
- For Division 2 and Zone 2 applications, install the system in an enclosure rated to at least IP54 as defined by IEC/EN 60079-15.
- You must make sure that transient disturbances do not exceed 140% of the rated voltage.
- The system shall only be used in an area of not more than Pollution Degree 2, as defined in IEC/EN 60664-1.
- The system shall be mounted in an ATEX/IECEx-certified enclosure with a minimum ingress protection rating of at least IP54 as defined in IEC/EN 60079-15.
- The enclosure must have a door or cover accessible only by the use of a tool.

Electromagnetic Compatibility Guidelines:

The NI-9775 was tested and complies with the regulatory requirements and limits for electromagnetic compatibility (EMC) stated in the product specifications. To minimize interference with radio and television reception and prevent unacceptable performance degradation, install and use this product in strict accordance with the instructions in the product documentation.

Product Usage Instructions

1. Complete the software and hardware installation procedures in your chassis documentation before use.
2. Refer to the user manual for safety guidelines specific to the NI-9775.
3. Connect only voltages that are within Measurement Category O.
4. Do not connect the NI-9775 to signals or use for measurements within Measurement Categories II, III, or IV.
5. Follow the safety guidelines for hazardous locations if installing the NI-9775 in a potentially explosive environment.
6. Install the system in an enclosure rated to at least IP54 as defined by IEC/EN 60079-15 for Division 2 and Zone 2 applications.
7. Make sure that transient disturbances do not exceed 140% of the rated voltage.
8. The system shall only be used in an area of not more than Pollution Degree 2, as defined in IEC/EN 60664-1.
9. The system shall be mounted in an ATEX/IECEx-certified enclosure with a minimum ingress protection rating of at least IP54 as defined in IEC/EN 60079-15.
10. The enclosure must have a door or cover accessible only by the use of a tool.
11. Refer to the user manual for further usage instructions.

GETTING STARTED GUIDE

NI 9775
4-Ch, ±10 V, 20 MS/s, 14-Bit Digitizer

This document explains how to connect to the NI 9775.

- **Note** Before you begin, complete the software and hardware installation procedures in your chassis documentation.
- **Note** The guidelines in this document are specific to the NI 9775. The other components in the system might not meet the same safety ratings. Refer to the documentation for each component in the system to determine the safety and EMC ratings for the entire system.

Safety Guidelines

Operate the NI 9775 only as described in this document.

- **Caution** Do not operate the NI 9775 in a manner not specified in this document. Product misuse can result in a hazard. You can compromise the safety protection built into the product if the product is damaged in any way. If the product is damaged, return it to NI for repair.

Safety Voltages

Connect only voltages that are within Measurement Category O.

Isolation

- Channel-to-channel None
- Channel-to-earth ground None

Note Measurement Categories CAT I and CAT O are equivalent. These test and measurement circuits are not intended for direct connection to the MAINS building installations of Measurement Categories CAT II, CAT III, or CAT IV.

Caution Do not connect the NI 9775 to signals or use for measurements within Measurement Categories II, III, or IV.

Safety Guidelines for Hazardous Locations

The NI 9775 is suitable for use in Class I, Division 2, Groups A, B, C, D, T4 hazardous locations; Class I, Zone 2, AEx nA IIC T4 and Ex nA IIC T4 hazardous locations; and nonhazardous locations only. Follow these guidelines if you are installing the NI 9775 in a potentially explosive environment. Not following these guidelines may result in serious injury or death.

- **Caution** Do not disconnect I/O-side wires or connectors unless power has been switched off or the area is known to be nonhazardous.
- **Caution** Do not remove modules unless power has been switched off or the area is known to be nonhazardous.
- **Caution** Substitution of components may impair suitability for Class I, Division 2.
- **Caution** For Division 2 and Zone 2 applications, install the system in an enclosure rated to at least IP54 as

defined by IEC/EN 60079-15.

Special Conditions for Hazardous Locations Use in Europe and Internationally
The NI 9775 has been evaluated as Ex nA IIC T4 Gc equipment under DEMKO 12 ATEX 1202658X and is IECEx UL 14.0089X certified. Each NI 9775 is marked II 3G and is suitable for use in Zone 2 hazardous locations, in ambient temperatures of -40 °C ≤ Ta ≤ 70 °C. If you are using the NI 9775 in Gas Group IIC hazardous locations, you must use the device in an NI chassis that has been evaluated as Ex nC IIC T4, Ex IIC T4, Ex nA IIC T4, or Ex nL IIC T4 equipment.

- **Caution** You must make sure that transient disturbances do not exceed 140% of the rated voltage.
- **Caution** The system shall only be used in an area of not more than Pollution Degree 2, as defined in IEC/EN 60664-1.
- **Caution** The system shall be mounted in an ATEX/IECEx-certified enclosure with a minimum ingress protection rating of at least IP54 as defined in IEC/EN 60079-15.
- **Caution** The enclosure must have a door or cover accessible only by the use of a tool.

Electromagnetic Compatibility Guidelines

This product was tested and complies with the regulatory requirements and limits for electromagnetic compatibility (EMC) stated in the product specifications. These requirements and limits provide reasonable protection against harmful interference when the product is operated in the intended operational electromagnetic environment.
This product is intended for use in industrial locations. However, harmful interference may occur in some installations, when the product is connected to a peripheral device or test object, or if the product is used in residential or commercial areas. To minimize interference with radio and television reception and prevent unacceptable performance degradation, install and use this product in strict accordance with the instructions in the product documentation.
Furthermore, any changes or modifications to the product not expressly approved by National Instruments could void your authority to operate it under your local regulatory rules.

Caution To ensure the specified EMC performance, operate this product only with shielded cables and accessories. Do not use unshielded cables or accessories unless they are installed in a shielded enclosure with properly designed and shielded input/output ports and connected to the product using a shielded cable. If unshielded cables or accessories are not properly installed and shielded, the EMC specifications for the product are no longer guaranteed.
Caution To ensure the specified EMC performance, the length of all I/O cables must be no longer than 30 m (100 ft).

Special Conditions for Marine Applications
Some products are Lloyd's Register (LR) Type Approved for marine (shipboard) applications. To verify Lloyd's Register certification for a product, visit ni.com/certification and search for the LR certificate, or look for the Lloyd's Register mark on the product.

Caution In order to meet the EMC requirements for marine applications, install the product in a shielded enclosure with shielded and/or filtered power and input/output ports. In addition, take precautions when designing, selecting, and installing measurement probes and cables to ensure that the desired EMC performance is attained.

Preparing the Environment

Ensure that the environment in which you are using the NI 9775 meets the following specifications.

- Operating temperature (IEC 60068-2-1, IEC 60068-2-2) -40 °C to 70 °C
- Operating humidity (IEC 60068-2-78) 10% RH to 90% RH, noncondensing

- Pollution Degree 2
- Maximum altitude 5,000 m

Indoor use only.
Note Refer to the device datasheet on ni.com/manuals for complete specifications.

NI 9775 Pinout

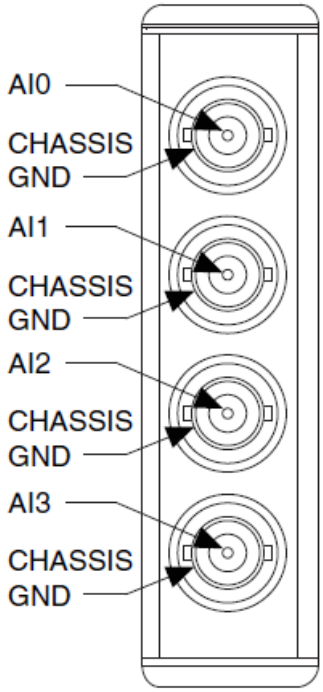
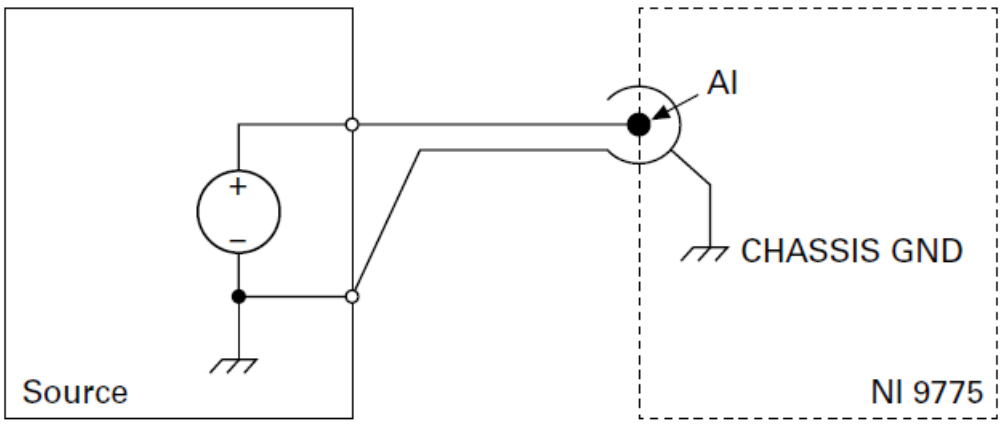


Table 1. Signal Descriptions

Signal	Description
AI	Analog input signal connection
CHASSIS GND	Chassis ground connection

Single-Ended Connections



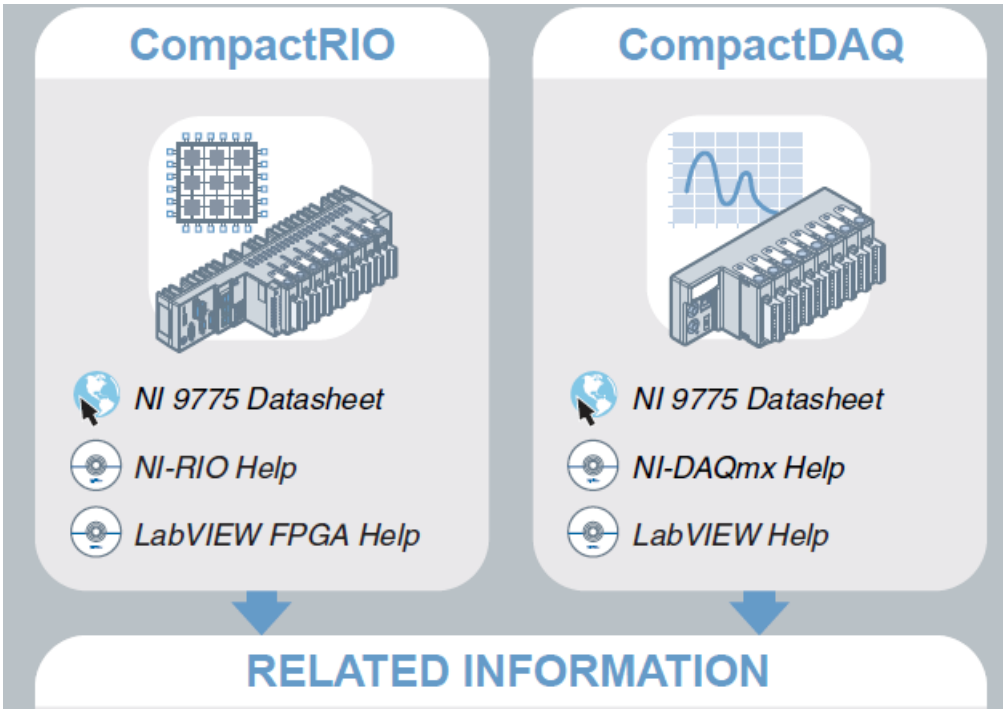
NI 9775 Connection Guidelines

Make sure that devices you connect to the NI 9775 are compatible with the module specifications.

Overvoltage Protection
The NI 9775 provides overvoltage protection for each channel.

Note Refer to the device datasheet on ni.com/manuals for more information about overvoltage protection.

Where to Go Next



C Series Documentation & Resources
ni.com/info cseriesdoc

Services
ni.com/services

Located at ni.com/manuals
Installs with the software

Worldwide Support and Services

The NI website is your complete resource for technical support. At ni.com/support, you have access to everything from troubleshooting and application development self-help resources to email and phone assistance from NI Application Engineers.
Visit ni.com/services for NI Factory Installation Services, repairs, extended warranty, and other services.
Visit ni.com/register to register your NI product. Product registration facilitates technical support and ensures that you receive important information updates from NI.
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11500 North Mopac Expressway, Austin, Texas, 78759-3504. NI also has offices located around the world. For telephone support in the United States, create your service request at ni.com/support or dial 1 866 ASK MYNI (275 6964). For telephone support outside the United States, visit the Worldwide Offices section of

ni.com/niglobal to access the branch office websites, which provide up-to-date contact information, support phone numbers, email addresses, and current events.

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Documents / Resources

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References

- Engineer Ambitiously - NI
- Engineer Ambitiously - NI
- Calibration Services - NI
- Product Certifications - NI
- Software and Driver Downloads - NI
- Using Info Codes - NI
- Trade Compliance - NI
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